

Exemption No. 6477

**UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056**

In the matter of the petition of

Custom Products, Inc.

Regulatory Docket No. 28487

for exemption from §§ 25.853(a) of the Federal
Aviation Regulations

PARTIAL GRANT OF EXEMPTION

By letters dated January 25, February 8, March 14, and March 26, 1996, Mr. Stuart Patch, General Manager, Custom Products Inc., P.O. Box 1141, 1618 Landis Highway, Mooresville, NC 28115, petitioned for themselves and their customers, for exemption from vertical burn test requirements for their seat cushions assembled with currently available water-based adhesives. These water-based adhesives are the only viable alternatives to the currently utilized solvent-based adhesives which do comply with these requirements, but which are becoming no longer available.

Affected Sections of the FAR:

Section 25.853(a) requires that materials in occupied compartments must meet the applicable (12-second vertical burn test for seat cushions) test criteria prescribed in Part I of Appendix F.

Related Sections of the FAR:

Section 25.853(c) requires that seat cushions, in addition to meeting the (vertical burn) test requirements of § 25.853(a), must also meet the (oil burner) test requirements of Part II of Appendix F.

The petitioner's supportive information is as follows:

“At the present time, Custom Products, Inc., uses a solvent-based adhesive to bond foam to foam and fabrics to foam in the manufacture of aircraft seat cushions. The solvent in the adhesive is 1,1,1 Trichloroethane. Due to Environmental Protection Agency (EPA) rulings, 1, 1, 1 Trichloroethane will not be able to be produced after December 31, 1996. Therefore, alternative adhesives are being evaluated. The only other adhesive available that meets § 25.853(a) requirements uses methylene chloride as the solvent. Methylene chloride is a suspected carcinogen, and is not practical at the volume of adhesive we use. The only other alternatives are water-based adhesives.

“In addition, due to the volume of adhesive we use each year, we are being required to file a Title V operating permit (air quality). This application is very detailed, and is a time consuming and costly process. Our application is due August 12, 1996. If we switch to a water-based adhesive, we will not be required to file the permit application.

“Water-based adhesives have replaced solvent-based adhesives in most industries. However, currently, no water-based adhesive can meet the requirements of § 25.853(a). We have worked with five manufacturers of water-based adhesives (3M., National Starch, Imperial, Mid South, and Franklin), and all have tried to modify their adhesive to meet § 25.853(a) requirements. Specimens made with water-based adhesives will meet § 25.853(c) requirements (oil burn test).

“Due to the limited time remaining before our Title V permit application is due, and the fact that our current adhesive will not be available after 1996, we are asking that we be allowed to switch to a water-based adhesive, and it be exempt from the requirements of § 25.853(a). We are also asking that this exemption be extended to our customers who sell seats to airlines and have to provide certification to § 25.853 requirements. These customers are AMI Industries, Inc., Burns Aerospace Corporation, and Weber Aircraft, Inc. We will continue to work with the adhesive suppliers to develop an adhesive that meets the requirements of § 25.853(a).”

Additional information is as follows:

“Item a) Three different manufacturer's water based adhesives have been evaluated since 1993. The forty tests conducted show a wide range of results. The ranges for the type with the best vertical burn properties are as follows:

<u>Criteria</u>	<u>Max. allowable</u>	<u>Low</u>	<u>High</u>
Extinguished time (sec)	15	2.17	39.7
Burn length (inches)	8	0.13	8.9
Drip extinguish time (sec)	5	0.0	37.0

“Item b) With regard to exposure of the cabin to the adhesive, we propose that the exemption be limited to cushions which are constructed so the adhesive has no direct exposure to the aircraft cabin. This is normally the case in standard cushion assemblies where the foam bonded with the adhesive is completely encased in a fire blocking liner or fabric, but including this limitation in the exemption would prevent any future designs from leaving edges or joints exposed to the cabin.

“The oil burner test is conducted on a cushion assembly. Therefore, the oil burner test is more indicative of the cushion's overall flammability resistance as it is used in service than the vertical burn test done on components of the cushion. We feel this makes the oil burner test the more important and more representative of the tests, and that adhesives that do not pass the vertical burn test, being inside the cushion assembly, will have a negligible effect on the flammability of the overall cushion. Thus, the safety of the airplane occupants would not in any way be lessened by the granting of this exemption. We understand that Dick Hill of the FAA Technical Center may also share this view.

“Item c) Alternative construction methods using mechanical fasteners such as velcro are not practical, as a back cushion may contain from ten to twenty various pieces of foam. The velcro would need to be attached to the foam, and pressure sensitive velcro will not stitch to foam. The current method used to attach velcro to foam is to sew it to fabric and bond the fabric to the foam.

“Item d) All seat manufacturers and cushion manufacturers are impacted by the discontinuation of 1,1,1 Trichloroethane. The three seat manufacturers referenced above are impacted. Also, three other cushion manufacturers are affected and are evaluating water-based adhesives. I feel comfortable in stating that this is an industry-wide problem.”

“The use of water-based adhesives to bond aircraft seat cushions would be in the public interest, because the 1,1,1 Trichloroethane is being discontinued and we are faced with the following alternatives if we cannot use a water-based adhesive:

“1) Use a methylene chloride solvent-based adhesive. Methylene chloride is a suspected carcinogen and would expose our employees to this hazard, which is not in the public interest.

“2) Go out of business, as no other adhesive is available. This would put seventy-five people out of work, which is not in the public interest.

“3) Relocate our facility to a foreign country, or purchase cushions from a foreign country that can use 1,1,1 Trichlorethane. Again, this it not in the public interest, because 1,1,1 Trichloroethane has been determined by the EPA to be an ozone-depleting agent.”

A summary of Custom Products' petition was published in the Federal Register on April 15, 1996 (61 FR 16519). No comments were received.

The FAA's analysis/summary is as follows:

Custom Products' petition is a request for temporary relief, to allow the continued manufacture and use of seat cushion assemblies which are proposed to be assembled with water-based adhesives that currently do not comply with the FAA's vertical burn flammability requirement, in lieu of a currently utilized and compliant solvent-based adhesive that is becoming unavailable through EPA regulatory action. The FAA notes the petitioner's apparent good-faith efforts to date in attempting to locate an alternative adhesive that is compliant, the petitioner's several suggested conditions that might be a part of any grant of exemption, and the lack of any reasonable alternatives at this point.

The FAA considers that some measure of relief for the petitioner is warranted, but is particularly concerned with any digression from full compliance with the flammability requirements. Consequently this response is intended to provide the requested action while limiting any relief only to the degree the FAA considers absolutely necessary. The FAA concurs with the petitioner's suggestions and shall consider it mandatory that the search for a compliant adhesive shall continue and that the cushions shall be assembled with none of the non-complaint adhesive exposed to the airplane cabin.

Except as indicated below, to avoid creating an unnecessary hardship on owners of affected seat cushion assemblies in service (i.e., the operators) that are already inherently life-limited, the granted relief to Custom Products shall expire after a period of time considered reasonable by the FAA for developing or discovering a replacement, compliant adhesive. During this period of time, in addition to searching for a compliant adhesive, the petitioner shall also be required to explore alternative methods for constructing seat cushion assemblies. This provision is added so that alternatives to adhesives are addressed in the event that no compliant adhesives are developed by the expiration date of this exemption, and is considered to be a potential benefit to the petitioner.

The continued compliance of affected, fully-assembled seat cushions with the very severe, and much more meaningful, oil burner test requirements of § 25.853(c), even when these cushions are assembled internally with adhesives that do not pass the much less rigorous vertical burn

flammability test requirements of § 25.853(a), provides the basic justification for this limited grant of exemption. Recent fleet-wide surveys have indicated that the integrity of seat cushion fire-blocking in service is generally maintained sufficiently to assure the degree of fire protection required. Therefore, the primary consideration here is to assure that none of the non-complaint adhesive is exposed to the airplane cabin. This has been made a condition of this exemption.

Notwithstanding the above, in consideration of the possibility that the integrity of an affected seat cushion may be breached in service to expose some non-compliant adhesive to the cabin environment, and that same cushion is then subjected to a fire, a concern exists to minimize the flammability of the adhesive used. This may be accomplished for the range of non-compliant adhesives available by utilizing (an) adhesive(s) with the most favorable flammability characteristics. Consequently, as a condition of this grant, the FAA shall require Custom Products to submit a formal proposal in this regard which would tabulate available non-compliant water-based adhesives with their flammability test results, and include a justified recommendation for selection.

In consideration of the foregoing, I find that a partial grant of exemption is in the public interest, and is determined to have no more than a negligible effect on the level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 USC 40113 and 44701, delegated to me by the Administrator (14 CFR 11.53), Custom Products' petition for exemption from the vertical burn test requirements of § 25.853(a) for Custom Products' seat cushion assemblies constructed with non-compliant water-based adhesives is granted until June 30, 1998, under the conditions listed below. In addition, the FAA intends that the effect of this exemption be that other persons installing Custom Products seat cushions manufactured in accordance with this exemption, or operating airplanes on which such cushions are installed, are allowed to engage in those activities, notwithstanding other regulations [e.g., §121.312(b)] that would otherwise require use of seat cushions complying with §25.853(a).

(1) Custom Products shall continue to work with adhesives suppliers to develop an adhesive which complies with all requirements. Concurrently, Custom Products shall pursue other means of construction which avoid adhesives.

(2) This exemption is valid only for Custom Products' seat cushion assemblies that are constructed such that any non-compliant adhesives are completely encased in fire blocking, without any exposure of these adhesives to the aircraft cabin.

(3) Custom Products' utilization of non-compliant water-based adhesives in the construction of seat cushions shall be restricted to those adhesive(s), among all the alternatives available, which FAA opinion determines offers the most favorable overall compromise relative to compliance with the three individual vertical burn test parameters (extinguishment time, burn length, and drip extinguishment time). Custom

Products shall submit a proposal in this regard to the FAA Transport Airplane Directorate, Attn: Docket 28487, and obtain its concurrence, prior to the utilization of the proposed adhesive.

(4) Seat cushion assemblies manufactured under the auspices of this partial grant of exemption shall include the indelible and conspicuous identification that they do not comply with § 25.853(a) vertical burn test requirements, in accordance with this exemption.

Issued in Renton, Washington, on

Bill R. Boxwell
Acting Manager
Transport Airplane Directorate,
Aircraft Certification Service